FEMA

State Emergency Management Agency
COOPERATING TECHNICAL PARTNER
MAPPING ACTIVITY STATEMENT

Mapping Activity Statement No. 15 – Detailed Countywide Scoping and Development of Updated Flood Data

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated June 17, 1999 between the State Emergency Management Agency and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement (MAS) No. 15 is as follows:

SECTION 1—OBJECTIVE AND SCOPE

The objective of the Flood Map Project documented in this Mapping Activity Statement is to conduct countywide scoping and develop update flood data for use in a planned Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for the counties shown in Table 1.1. The planned DFIRM will be produced in the FEMA countywide format.

Scoping will be necessary to determine the final scope of work for the planned project. Existing Geographic Information System (GIS) data and study needs for each countywide study will be researched, obtained, organized, and provided in accordance with the Scoping Activity. In addition, the Mapping Partners involved in this project will develop new flood hazard data by approximate methods as summarized in Table 1.1.

This Flood Map Project will be completed by the following Mapping Partner:

- State Emergency Management Agency; and
- AMEC Earth and Environmental Inc.

The Mapping Partner will complete the following tasks as part of this MAS / SOW:

- Detailed Scoping;
- Topographic Data Development;
- Hydrologic Analysis for approximate studies;
- Hydraulic Analysis for approximate studies; and
- Floodplain Mapping for approximate analysis

The Mapping Partner shall notify FEMA and the RMC by e-mail of all meetings with community officials at least two weeks prior to the meeting (with as much notice as possible). FEMA and the RMC may or may not attend the community meetings.

FEMA has developed tools to assist in the development of the flood hazard data studies and DFIRMs if the Mapping Partner wishes to use them. FEMA will provide all Mapping Partners access to and training in these tools. The tools available at this time include WISE software and the DFIRM production tools. The use of these tools will improve the Flood Map Modernization and efficiency of all mapping partners.

Table 1-1. Summary of Mapping Effort

County	Approximate Analysis (see note 1)	Detailed Scoping
Andrew County	X	X
Barton County	X	X
Bates County	X	X
Boone County		X
Buchanan County		X
Cape Girardeau County		X
Cass County		X
Christian County	X	X
Clay County	X	X
Clinton County	X	X
Cole County		X
Cooper County	X	X
Crawford County	X	X
Dallas County	X	X
Franklin County		X
Gasconade County	X	X
Greene County		X
Henry County	X	X
Howell County	X	X
Jackson County (KC only)	X	X
Jackson County (less KC)		X
Jasper County		X
Jefferson County		X
Johnson County	X	X
Laclede County	X	X
Lafayette County	X	X
Lawrence County	X	X
Moniteau County	X	X
Newton County	X	X
Perry County	X	X
Platte County	X	X
Pulaski County	X	X
Ray County	X	X
Scott County	X	X
St Charles County		X
St. Francois County	X	X
St Louis County		X
St Louis City	X	X
Stone County	X	X
Wayne County	X	X

Note 1: All streams with drainage greater than 1 sq. mile not studied by detailed methods; and all streams with drainage less than 1 sq. mile that have effective approximate mapping.

FEMA has developed tools to assist in the development of the flood hazard data studies and DFIRMs if the Mapping Partner wishes to use them. FEMA will provide all Mapping Partners access to and training in these tools. The tools available at this time include WISE software and the DFIRM production tools. The use of these tools will improve the Flood Map Modernization and efficiency of all mapping partners.

FEMA will be providing download/upload capability for intermediate data submittals through the MIP. A Federal Geographic Data Committee (FGDC) adopted metadata profile, Content Standard for Digital Geospatial Metadata (CSDGM), must accompany the uploaded digital data in order to facilitate proper cataloging of the data for search and retrieve capabilities within the MIP. The metadata profile should be obtained from FEMA or its contractor to assure compliance.

Metadata profiles are to be included with each of the following four activities that must satisfy Data Capture Standards; Base Map Data, Topographic Data, Hydrologic Data, and Hydraulic Data. The metadata profiles are available from FEMA.

SCOPING

Responsible Mapping Partner: State Emergency Management Agency

Introduction: Project Scoping activities for New Studies are grouped into Pre-Scoping, Scoping, and Post-Scoping activities. Many of the activities within each group can take place concurrently and are not contingent on the completion of previous activities. In addition, the FEMA Regional Project Officer has the flexibility to tailor the scoping process to fit the needs of the project as negotiated. For example, for smaller Flood Map Projects, FEMA Regional Project Officer may wish to combine, scale back, or eliminate certain activities.

In coordination with the National Service Provider (NSP) and the Regional Management Center (RMC), the Mapping Partner shall use the WISE Scoping Tool on the Mapping Information Platform (MIP) for this phase. FEMA, through the RMC, will provide access and training for this tool. The use of this and other tools will improve the Map Modernization and efficiency of all mapping partners. The WISE Scoping Tool documentation can be obtained from the RMC.

The MIP Workflow will also be utilized throughout the Scoping activities. The RMC will populate the screens in the "Create Project" module that pertain to Scoping. The Mapping Partner will populate the required information in the "Manage Scoping" modules.

Appendix I of the Guidelines and Specifications for Flood Hazard Mapping Partners contains a Project Scoping Toolbox. The toolbox describes a scoping process and offers several checklists, templates and report formats that may be used. The Mapping Partner may utilize the toolbox to fulfill the requirements of the scoping task.

Table 1.2 summarizes the counties that are included in this Mapping Activity Statement or Task Order.

Table 1.2 – Summary of Scoping Effort

County Name	Pre-Scoping Report Avail. from RMC	New County	Expanded Scope	Existing DFIRM, additional study
Andrew County		X		
Barton County		X		
Bates County		X		
Boone County				X
Buchanan County			X	
Cape Girardeau County			X	
Cass County				X
Christian County	X	X		
Clay County		X		
Clinton County		X		
Cole County				X
Cooper County	X	X		
Crawford County		X		
Dallas County		X		
Franklin County			X	
Gasconade County		X		
Greene County				X
Henry County		X		
Howell County		X		
Jackson County (KC only)		X		
Jackson County (less KC)				X
Jasper County				X
Jefferson County				X
Johnson County	X	X		
Laclede County		X		
Lafayette County		X		
Lawrence County		X		
Moniteau County		X		
Newton County		X		
Perry County		X		
Platte County		X		
Pulaski County		X		
Ray County		X		
Scott County		X		
St Charles County			X	
St. Francois County		X		
St Louis County			X	
St Louis City		X		
Stone County		X		
Wayne County		X		

Scope: The following sections describe the specific activities associated with the scoping task. Each activity description identifies the scope and deliverables.

Scoping Task Activities	
Activities	***Pre-Scoping Activities***
Scoping Activity 1	Initial Community Contact
Scoping Activity 2	Data Collection and Preparation
Scoping Activity 3	Setup and Population of WISE Scoping Tool Project
Scoping Activity 4	Validation of Existing Flood Data and Engineering Analysis
Scoping Activity 5	Conceptual Mapping Project
Scoping Activity 6	Scoping Meeting Invitation Letters
	Scoping Activities
Scoping Activity 7	Conduct Scoping Meeting
Scoping Activity 8	NDEP/NDOP Research and Population
Scoping Activity 9	Mapping Needs List Prioritization and Finalization
	Post-Scoping Activities
Scoping Activity 10	Statement of Work or Mapping Activity Statement Preparation
Scoping Activity 11	Time and Cost Preparation

Deliverables: The deliverables for each scoping activity are described in greater detail as applicable.

The MIP shall be updated for status reporting not less than quarterly and when the scoping task is complete.

Scoping Activity 1 - Initial Community Contact

Scope: The Mapping Partner will contact the community (or communities) as soon as possible after initiation of a Flood Map Project to provide notification that FEMA has selected the community for a possible map update and will be working with the community to develop the project scope. The following topics shall be reviewed and documented during the initial contact:

- Purpose of the Flood Map Project (i.e., the update needs that have prompted the map update under Map Modernization);
- The community's perception of its mapping needs, validity of the effective flood hazard data, and mapping needs priorities described in Scoping Activity 9;
- Target schedule(s) for completing the project;
- The community's engineering, planning, and Geographic Information System (GIS) capabilities and available data; and
- The community's available orthophotography and elevation data, as described in Scoping Activity 8.

In addition, the following activities will be performed during the initial contact stage:

- Inventory the FEMA library for effective FIRM panels, FIS reports, and other flood hazard data or existing study data;
- Summarize contiguous community agreement checks; and
- Obtain any existing Map Need Assessment's (MNA's) done by the community, and document information that pertains to FEMA Flood Map studies.

FEMA and the community will agree on the general outline of the community's participation in the Flood Map Project. For the purpose of data licensing consent, a Partnership Agreement may be required when the community will supply data.

Deliverables: Upon completion of this activity, a summary of the initial community contacts shall be uploaded to the MIP for each project through the Load Data Artifacts portlet in the Manage Scoping module.

Scoping Activity 2 - Data Collection and Preparation

Scope: The Data Collection and Preparation effort includes:

- Acquire effective FIRMs, FIS reports, LOMCs, and any other applicable information;
- Collect GIS base data in vector shapefile format. Various sources may be available, but the best available data should be used. GIS data will include base data, stream centerline vector data, and FEMA Q3 data (if available). Required base data is political boundaries and transportation;
- Prepare the data in a GIS package. Assign a single, appropriate State Plane coordinate system to the dataset. Use GIS functions to clip all data to the extent of the county boundary. Attribute the spatial data accordingly; and

- Collect Effective FIRM Panel Index and create the Proposed FIRM Panel Index meeting *Guidelines and Specifications.*

All work under Scoping Activity 2 shall be performed in accordance with the standards specified in the WISE Scoping Module User Guide.

Deliverables: Properly formatted data for WISE Scoping Project.

Scoping Activity 3 - Setup and Population of WISE Scoping Tool Project

Scope: Create a WISE Scoping Tool Project for each county. This effort will include:

- Create project and set source data;
- Create Shapefiles for all Stream Reaches, Existing Data Study, levees credited as providing protection (as identified by FEMA), and Significant Area(s) for consideration;
- Capture effective reaches and determine mileage;
- Populate Community Information fields - General Community Information, GIS Data Availability, and Community Contacts; and
- QC of WISE Project database upon completion of preceding steps.

All work under Scoping Activity 3 shall be performed in accordance with the standards specified in the WISE Scoping Module User Guide. All work must also be done with the WISE Scoping Tool on the Mapping Information Platform (MIP).

Deliverables: WISE Scoping Project.

Scoping Activity 4 – Assessment of Existing Flood Data and Engineering Analysis

Scope: Mapping Partner shall assess existing flood data and engineering methodologies for anomalies. This includes, but is not limited to, researching the current FIS and concluding if data and methodologies continue to be adequate and reasonable. The Mapping Partner shall also determine if this assessment supports the community perceptions of mapping needs identified in Scoping Activity 1.

Deliverables: The mapping partner shall document the stream reaches evaluated and the results of the assessment in the WISE Scoping Tool. This would include a statement-of-acceptability if the assessment determines a study adequate under existing conditions. If the assessment renders a study no longer valid due to changed physical conditions, inappropriate assumptions, or unacceptable methodologies, then these findings should be documented in the WISE Scoping Tool.

Scoping Activity 5 – Conceptual Mapping Project

Scope: Using the information compiled in Scoping Activity 1 – 4 the Mapping Partner shall develop a conceptual mapping project for each county. The concept should consider:

- Levee Information provided by FEMA
- Risk Class Assessment provided by FEMA
- Effective stream mileage by Zone type
- Assessment of existing flood hazard data
- Data from Map Needs Update Support System Report
- Data from Flood Map Status Information System
- Base Map of Pre-Scoping Data
- Effective FIRM Panel Layout with Maps
- Proposed FIRM Panel Layout with Maps

The Conceptual Mapping Project will include the following:

- Review and incorporate background research and community outreach information;
- Determining what effective FIS data can be used in the analyses and/or transferred to the new flood map project;
- Identifying other data needed to complete the Flood Map Project and sources of those data (e.g., base map, topography, cross sections, transects);
- Establishing priority levels for flooding sources to be analyzed and mapped;
- Making DFIRM format decisions; and
- Developing conceptual schedules and cost estimates, along with an explanation of estimates, of the components of the flood map project.

Once the Conceptual Mapping Project has been prepared, the Mapping Partner shall arrange an initial Project Management Team conference call that includes the Mapping Partner, FEMA, and the RMC. For more complex projects, and at the discretion of the Mapping Partner, the call may include appropriate community representatives. If more than one community is involved, the Mapping Partner shall decide whether to conduct separate calls for each community or a combined conference call.

The Conceptual Mapping Project will be revised as needed following the Project Management Team conference call. The revised Conceptual Mapping Project will be used as the basis of discussion at the scoping meeting.

Deliverables: The Mapping Partner shall provide an electronic copy of the Conceptual Mapping Project to the FEMA Project Officer.

Scoping Activity 6 – Scoping Meeting Invitation Letters

Scope: The Mapping Partner shall prepare a detailed meeting agenda for the Scoping Meeting. The Mapping Partner shall distribute the Scoping Meeting agenda and the Conceptual Mapping Project to all communities as an attachment to the Scoping Meeting invitation letter prior to the Scoping Meeting.

Deliverables: A copy of each community's invitation letter, the agenda and the Conceptual Mapping Project shall be uploaded to the MIP for each project through the Load Data Artifacts portlet in the Manage Scoping module. A hardcopy of each invitation letter and agenda shall be provided to the FEMA Project Officer for inclusion in the Docket File for each community.

Scoping Activity 7 – Conduct Scoping Meeting

Responsible Entity: Mapping Partner(s)

Scope: The Mapping Partner shall conduct a scoping meeting. The Mapping Partner shall be responsible for scheduling and coordinating all aspects of the Scoping Meeting. At minimum, the Mapping Partner shall discuss the results of the initial community contacts, assessment of the engineering assessment, the conceptual project, community participation in the project, and the proposed schedule. The Mapping Partner shall record attendance and prepare meeting minutes.

A FEMA representative will attend the scoping meeting for those counties that have a levee(s) that is credited on the effective FIRM.

The structure of the meeting shall vary depending on the anticipated scope and complexity of the project. A list of suggested items to bring to the Scoping Meeting and topics is provided in Appendix I.

Deliverables: Upon completion of this activity the Mapping Partner shall:

- Update the WISE Scoping Tool;
- Upload the attendance sheet to the MIP through the Load Data Artifacts portlet in the Manage Scoping module;
- Upload the meeting minutes to the MIP through the Load Data Artifacts portlet in the Manage Scoping module;
- Distribute the minutes to the project team; and
- The attendance sheet and meeting minutes shall be provided to the FEMA Project Officer for inclusion in the Docket for each community.

Scoping Activity 8 – NDEP/NDOP Research and Population

Scope: Elevation or orthophotography data assessed during Scoping Activity 1 that will be used for the project will need to be documented in accordance with the NDEP/NDOP Project Tracking System Guidance Document. This document is available from the RMC on request. The following information will be collected:

- Identification Information
- Project Information
- Project Location
- Spatial Reference Information

Deliverables: Upload the information to the NDEP/NDOP websites once the project scope is finalized.

- NDEP – https://hazards.fema.gov/metadata/NDEP/
- NDOP – https://hazards.fema.gov/metadata/NDOP/

Scoping Activity 9 – Mapping Needs List Prioritization and Finalization

Scope: The Mapping Partner and FEMA Regional Project Officer shall prioritize and finalize the mapping needs for each county. The WISE Scoping Tool shall be used to rank all mapping needs. Mapping needs will be ranked using the following criteria:

- Areas with a high risk classification;
- Areas that have gone through the engineering data assessment process as described in Activity 4;
- Areas of dense existing or anticipated development, including areas where new road crossings have been constructed over the subject stream(s);
- Areas affected by flood-control structures and/or channelization;
- Areas where natural physical changes in the floodplain have been significant;
- Areas that were studied by approximate methods and unmapped areas, especially those with development pressure;
- Areas where the community has experienced flooding outside mapped floodplains, with severe damage to buildings and/or infrastructure;
- Areas where mapped flood hazards do not match those shown on contiguous FIRMs (unless those FIRMs are not considered to be accurate); and
- Areas where flood data (BFEs, floodplains, and regulatory floodways) are likely to be changed the most by a restudy.

Deliverables: Upon completion of this activity, the Mapping Partner shall submit a final mapping needs list. The list should include the mapping needs prioritization and indicate if the mapping needs will be addressed at this time. In addition to the list, the Mapping Partner shall ensure an updated WISE Scoping Tool Project file is available on the MIP. The WISE project file shall distinguish the map needs that will be funded at this time and those needs deferred until a later date.

Scoping Activity 10 –Mapping Activity Statement Preparation for Flood Insurance Rate Mapping and Flood Insurance Studies

Scope: Using information compiled during the pre-scoping, the Scoping Meeting and the Needs List Prioritization and Finalization a final Mapping Project will be developed by the Mapping Partner. The FEMA Regional Project Officer and Project Team shall be consulted on an as-needed basis.

The Mapping Partner shall develop a Statement of Work (SOW) or a Mapping Activity Statement (MAS) as appropriate. The Mapping Partner and FEMA Regional Project Officer shall review and approve the SOW or MAS before the Mapping Partner distributes it to the Project Team members. The SOW and/or MAS template will be provided by a FEMA Regional Project Officer.

Once the project is finalized the Mapping Partner will notify each community in writing of the final project scope. The notification shall also include the appointment of the Consultation Coordination Officer (CCO). The FEMA Project Officer will provide the name of the CCO.

Deliverables: Upon completion of this activity, the Mapping Partner shall prepare the draft SOW or MAS and deliver it to the Project Team for review and concurrence. After comments have been addressed the Mapping Partner shall provide an electronic copy of the final draft SOW or MAS to the FEMA Project Officer. After the final draft SOW or MAS has been accepted by FEMA, the Mapping Partner shall complete the "Finalize Project Scope" screens in the Manage Scoping Module in the MIP.

A hardcopy of the community notification shall be provided to the FEMA Project Officer for inclusion in the Docket File.

Scoping Activity 11 – Time and Cost Estimate Preparation for Flood Insurance Rate Mapping and Flood Insurance Studies

Scope: Based on the MAS developed in Scoping Activity 10 each mapping partner participating in the flood map project shall develop a time and cost estimate for assigned tasks. As part of these estimates, Project Team members also shall establish a schedule for their portion of the work within the schedule from the Scoping Meeting. The Project Team members shall submit their estimates to the FEMA Regional Project Officer. A template for preparing time and cost estimates is provided by the FEMA Regional Project Officer.

Deliverables:

- A report containing a time and cost estimate based on the MAS, for all tasks.
- Supplemental information that explains how the estimates were derived for this report.

Topographic Data Development

Responsible Mapping Partner: State Emergency Management Agency

Scope: This task includes obtaining and preparing existing elevation data from other sources for use in later tasks assigned in this Mapping Activity Statement. The Mapping Partner is not expected to provide certification of existing data obtained from other sources. The vertical datum for all elevation data shall be NAVD 1988.

If a DEM from the USGS is used for the project, additional assessment by State Emergency Management Agency is not needed.

Standards: All Topographic Data Development work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, State Emergency Management Agency shall make the following products available to FEMA by uploading the digital data to the MIP.

- An FGDC adopted metadata profile, CSDGM, must accompany the uploaded digital data in order to facilitate proper cataloging of the data for search and retrieve capabilities within the MIP. The metadata profile should be obtained from FEMA or its contractor to assure compliance. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

Topographic data obtained from a community source and used for approximate studies will include:

- Accuracy documentation if available from the community providing the data;
- Report summarizing methodology and results;
- Mass points and breaklines data if available from original source;
- Digital file with elevation data;
- Documentation of the Datum;
- Format Terrain Database or Data Delivery consistent with the Data Capture Standards–Appendix N of the *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
- A Summary Report that describes and provides the results of all automated or manual Quality Control review steps taken during the preparation of the DFIRM.

The MIP shall be updated for status reporting not less than quarterly and when the task is complete.

Quality Control Review of Topographic Data

Responsible Mapping Partner: State Emergency Management Agency

Scope: Independent QA/QC of topographic data shall apply specifically to data identified during detailed scoping and meeting the following criteria:

- Data coverage is sufficient for a new approximate study as described under Hydraulic Analyses and Flood Mapping ;
- Data accuracy equals or exceeds that of existing 1/3 Arc Second Digital Elevation Model available from the USGS; and
- Information obtained from the community suggests that data will meet all FEMA requirements.

If State Emergency Management Agency utilizes a contractor to perform the Quality Control, the contractor must be a different contractor than who contracted for or developed the topographic data. FEMA may audit or assist in these activities if deemed to be necessary by the Regional Project Officer.

Standards: All Topographic Data Development work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, State Emergency Management Agency shall make the following products available to FEMA by uploading the digital data to the MIP.

- An FGDC adopted metadata profile, CSDGM, must accompany the uploaded digital data in order to facilitate proper cataloging of the data for search and retrieve capabilities within the MIP. The metadata profile should be obtained from FEMA or its contractor to assure compliance. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.

- A Summary Report that describes the findings of the Quality Control review; and

- Recommendations to resolve any problems that are identified during the Quality Control review.

The MIP shall be updated for status reporting not less than quarterly and when the task is complete.

Hydrologic Analyses

Responsible Mapping Partner: State Emergency Management Agency

Scope: State Emergency Management Agency shall perform hydrologic analyses for approximately 15,611 square miles of drainage area for the flooding source(s) listed earlier in Table 1.1. The hydrologic methods used for this analysis will be regression equations. Peak flood discharges will be calculated for the 1% annual chance storm event.

If GIS-based modeling is used, State Emergency Management Agency shall document automated data processing and modeling algorithms, and provide the data to FEMA to ensure these are consistent with the standards outlined above. Digital datasets (such as elevation, basin, or land use data) are to be documented and provided to FEMA for approval before performing the hydrologic analyses to ensure the datasets meet minimum requirements. If non-commercial (i.e., custom-developed) software is used for the analysis, then State Emergency Management Agency shall provide full user documentation, technical algorithm documentation, and the software to FEMA for review before performing the hydrologic analyses.

The Mapping Partner will compare the calculated, or computed, discharge with discharge determined from reliable gage data, if any. This comparison will only be done at locations where the two discharge values are considered representative of the same flooding source. Results of this comparison will be used in making a professional judgment for determining the discharge to be used for the hydraulic analysis.

Prior to the initiation of work under Hydrologic Analyses, State Emergency Management Agency will provide the FEMA Regional Project Officer a brief description of internal Quality Control efforts.

The hydrologic analysis shall not include the Mississippi or Missouri Rivers.

Standards: All Hydrologic Analyses work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, State Emergency Management Agency shall make the following products available to FEMA by uploading the digital data to the MIP.

- An FGDC adopted metadata profile, CSDGM, must accompany the uploaded digital data in order to facilitate proper cataloging of the data for search and retrieve capabilities within the MIP. The metadata profile should be obtained from FEMA or its contractor to assure compliance. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.
- A brief description of your internal Quality Control efforts;
- Digital copies of all hydrologic modeling (input and output) files for the 1-percent-annual-chance storm event;
- Digital versions of all backup data used in the analysis, including work maps and basin delineation;
- For GIS-based modeling, deliverables shall include all input and output data, intermediate data processing products, and GIS data layers;
- Digital versions of draft text for inclusion in the FIS report (only for counties that require a FIS report);
- FEMA Format Hydrology Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards; and

County Name	Square Miles of Approximate Study
Andrew County	437
Barton County	597
Bates County	851
Christian County	564
Clay County	409
Clinton County	423
Cooper County	570
Crawford County	744
Dallas County	543
Gasconade County	526
Henry County	732
Howell County	928
Jackson County (KC only)	124
Johnson County	833
Laclede County	768
Lafayette County	639
Lawrence County	613
Moniteau County	419
Newton County	627
Perry County	484
Platte County	427
Pulaski County	551
Ray County	574
Scott County	426
St. Francois County	451
St Louis City	66
Stone County	511
Wayne County	774

- Brief summary report documenting the study area, methodologies, assumptions, and any other pertinent information related to the engineering analysis performed.

The MIP shall be updated for status reporting not less than quarterly and when the task is complete.

Hydraulic Analyses

Responsible Mapping Partner: State Emergency Management Agency

Scope: For the streams identified in Table 1.1 of this MAS that will be studied by approximate methods, State Emergency Management Agency shall perform hydraulic analyses for all flooding sources within each county that have a drainage area greater than or equal to 1 mi^2 and not studied by detailed methods. For all flood sources that have drainage areas less than 1 mi^2 and have effective approximate mapping, the State Emergency Management Agency shall also perform hydraulic analyses extending to the upstream limits of the effective study. The estimated length of approximate-studied streams is 19,510 – 20,910 miles for the flooding source(s). The modeling will include the 1% annual chance storm event based on peak discharges computed under the Hydrology Analysis task. The hydraulic methods used for this analysis will include the HEC-RAS computer program. The hydraulic analyses will be used to approximate flood elevations for the subject flooding sources.

The hydraulic analysis shall not include the Mississippi or Missouri Rivers.

State Emergency Management Agency shall document automated data processing and modeling algorithms for GIS-based modeling and provide the data to FEMA for review to ensure these are consistent with the standards outlined above. Digital datasets are to be documented and provided to FEMA for approval before performing the hydraulic analyses to ensure the datasets meet minimum requirements. If non-commercial (i.e., custom-developed) software is used for the analyses, then State Emergency Management Agency shall provide full user documentation, technical algorithm documentation, and software to FEMA for review before performing the hydraulic analyses.

Prior to the initiation of work under Hydraulic Analyses, State Emergency Management Agency will provide the FEMA Regional Project Officer a brief description of internal Quality Control efforts.

Standards: All Hydraulic Analyses work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, State Emergency Management Agency shall make the following products available to FEMA by uploading the digital data to the MIP.

- An FGDC adopted metadata profile, CSDGM, must accompany the uploaded digital data in order to facilitate proper cataloging of the data for search and retrieve capabilities within the MIP. The metadata profile should be obtained from FEMA or its contractor to assure compliance. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.
- A brief description of your internal Quality Control efforts;
- Digital versions of all hydraulic modeling (input and output) files;
- Digital versions of a table showing ranges of Manning's "n" values;
- Digital versions of all backup data used in the analyses;

County Name	Length of Stream studied by Approximate Methods (Min.-Max. Range *)
Andrew County	540 – 590
Barton County	750 – 800
Bates County	1,080 – 1,130
Christian County	710 – 760
Clay County	510 – 560
Clinton County	530 – 580
Cooper County	720 – 770
Crawford County	940 – 990
Dallas County	680 – 730
Gasconade County	660 – 710
Henry County	930 – 980
Howell County	1,180 – 1,230
Jackson County (KC only)	50 – 100
Johnson County	1,060 – 1,110
Laclede County	970 – 1,020
Lafayette County	810 – 860
Lawrence County	770 – 820
Moniteau County	520 – 570
Newton County	790 – 840
Perry County	600 – 650
Platte County	530 – 580
Pulaski County	690 – 740
Ray County	720 – 770
Scott County	530 – 580
St. Francois County	560 – 610
St Louis City	60 – 110
Stone County	640 – 690
Wayne County	980 – 1030

* The length of stream miles is an estimate only and does not take into account existing miles studied by detailed methods.

- For GIS-based modeling, deliverables include all input and output data, intermediate data processing products, GIS data layers, FEMA Format Hydraulic Database or Intermediate Data Delivery consistent with the FEMA Data Capture Standards;
- Digital versions of draft text for inclusion in the FIS report (only for counties that require a FIS report); and
- Brief summary report documenting the study area, methodologies, assumptions, and any other pertinent information related to the engineering analysis performed.

The MIP shall be updated for status reporting not less than quarterly and when the task is complete.

Floodplain Mapping

Responsible Mapping Partner: State Emergency Management Agency

Scope for Refinement or Creation of Zone A: State Emergency Management Agency shall delineate the 1-percent-annual-chance floodplain boundaries for the flooding sources listed in Table 1.1. State Emergency Management Agency shall use existing topographic data or the topographic data acquired under Topographic Data Development to delineate the floodplain boundaries on a digital work map. State Emergency Management Agency shall ensure that all flood sources are contained within the boundaries of the Floodway (if identified) and the Special Flood Hazard Area.

State Emergency Management Agency may expand on the approaches for analyzing Zone A areas outlined in *Guidelines and Specifications for Flood Hazard Mapping Partners* and in FEMA 265, *Managing Floodplain Development in Approximate Zone A Areas* (April 1995), and/or develop new approaches. Such approaches must be coordinated with and approved by the FEMA Regional Project Officer identified in Section 12 – Points of Contact, before analysis and mapping begin.

State Emergency Management Agency shall incorporate the results of all effective (at the time of funds award) Letters of Map Change (LOMCs) within the revised areas as appropriate. Only those LOMCs visible at the published map scale shall be included.

The floodplain mapping shall not include the Mississippi or Missouri Rivers.

Prior to the initiation of work under this task, State Emergency Management Agency will provide the FEMA Regional Project Officer a brief description of internal Quality Control efforts.

Standards: All Floodplain Mapping shall be performed in accordance with the standards specified in Section 4 of this SOW.

Deliverables: In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, State Emergency Management Agency shall make the following products available to FEMA by uploading the digital data to the MIP.

- An FGDC adopted metadata profile, CSDGM, must accompany the uploaded digital data in order to facilitate proper cataloging of the data for search and retrieve capabilities within the MIP. The metadata profile should be obtained from FEMA or its contractor to assure compliance. Where paper documentation is required by State Law for Professional certifications, you may submit the paper in addition to a scanned version of the paper for the digital record.
- Digital work map showing the 1-percent-annual-chance floodplain boundary delineations, flood insurance zone identifiers, and a suitable base map to facilitate the Quality Control;

- DFIRM mapping files prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- DFIRM mapping files in a format that will allow use by another Mapping Partner to prepare the DFIRM at a later date;
- A Summary Report that describes and provides the results of all automated or manual Quality Control review steps taken during the preparation of the DFIRM as outlined in the approved Quality Control Plan;
- Format Mapping Database or Data Delivery consistent with the Data Capture Standards–Appendix N of the *Guidelines and Specifications for Flood Hazard Mapping Partners*;

The MIP shall be updated for status reporting not less than quarterly and when the task is complete.

SECTION 2—TECHNICAL AND ADMINISTRATIVE SUPPORT DATA SUBMITTAL

The Project Team members for this Flood Map Project that have responsibilities for activities included in this Mapping Activity Statement shall comply with the data submittal requirements summarized below.

All supporting documentation for the activities in this MAS shall be submitted in the TSDN format in accordance with Appendix M of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners*, dated April 2003. Appendix M may be downloaded from the FEMA Flood Hazard Mapping website at http://www.fema.gov/pdf/fhm/frm_gsam.pdf. Table 2-1 indicates the sections of the TSDN that apply to each task.

If any issues arise that could affect the completion of an activity within the proposed scope, schedule or budget, the responsible Mapping Partner shall complete a Special Problem Report (SPR) as soon as possible after the issue is identified and submitted to FEMA. The SPR is to describe the issue and propose possible resolutions. (For additional information on SPRs, refer to Appendix M, Subsection M.2.1.1 of *Guidelines and Specifications for Flood Hazard Mapping Partners*.)

Table 2-1. Mapping Activities and Applicable TSDN Sections

TSDN Section	Mapping Activities					
	Scoping	Topo-graphic Data	QA/QC of Topo	Hydrology	Hydraulic Analysis	Floodplain Mapping
General Documentation						
Special Problem Reports	X	X	X	X	X	X
Telephone Conversation Reports	X	X	X	X	X	X
Meeting Minutes/ Reports	X	X	X	X	X	X
General Correspondence	X	X	X	X	X	X
Engineering Analyses						
Hydrologic Analyses				X	X	X
Hydraulic Analyses				X	X	X
Key to Cross-Section Labeling				X	X	X
Key to Transect Labeling				X	X	X
Draft FIS Report				X	X	
Mapping Information	X	X	X			X
Miscellaneous Reference Information	X	X	X	X	X	X

SECTION 3 – PERIOD OF PERFORMANCE

The mapping activities assigned to State Emergency Management Agency in this MAS will be completed within the period of performance as specified in the Agreement Articles of the Cooperative Agreement. The Mapping Activities may be terminated at the option of FEMA or State Emergency Management Agency in accordance with the provisions of the September 1, 1999 CTP Partnership Agreement.

SECTION 4 - FUNDING

Funds will be provided to State Emergency Management Agency by FEMA through Cooperative Agreement [redacted] for the completion for this Flood Map Project. The Cooperative Agreement budget identifies the amount to be provided by each party. State Emergency Management Agency shall provide any additional resources required to complete the assigned activities for this Flood Map Project.

SECTION 5—STANDARDS

The standards relevant to this MAS are provided in Tables 5-1 and 5-2. Information on the correct volume, appendix, section, or subsection of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners* to be referenced for each mapping task are summarized in Table 5-2.

These guidelines may be downloaded from the FEMA Flood Hazard Mapping website at http://www.fema.gov/fhm/dl_cgs.shtm.

Table 5-1. Applicable Standards for Project Activities

	Activities					
Applicable Standards	**Scoping**	**Topo Data**	**QA/QC Topo Data**	**Hydrology**	**Hydraulic Analysis**	**Floodplain Mapping**
Guidelines and Specifications for Flood Hazard Mapping Partners, April 2003	X	X	X	X	X	X
American Congress on Surveying and Mapping Procedures	X	X	X			
Global Positioning System (GPS) Surveys: National Geodetic Survey (NGS-510), "Guidelines for Establishing GPS-Derived Ellipsoid Heights," November 1997	X	X	X			
Engineer Manual 1110-1-1000, *Photogrammetric Mapping* (USACE), July 1, 2002	X	X	X			
Engineer Manual 1110-2-1003, *Hydrographic Surveys* (USACE), January 1, 2002	X					
"Numerical Models Accepted by FEMA for NFIP Usage," Updated April 2003	X			X	X	
Content Standard for Digital Geospatial Metadata (Federal Geographic Data Committee), 1998	X	X	X	X	X	X
Document Control Procedures Manual, December 2000	X					
44 Code of Federal Regulations Part 66 and 67	X					

Table 5-2. Project Tasks and Applicable Portions of FEMA Guidelines and Specifications

Activity Description	Applicable Volume, Section/Subsection, and Appendix
Scoping	Appendix I and 44 Code of Federal Regulations Part 66 and 67
Topographic Data Development	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.2 , A.3, A.7, and A.8 Appendix M
Independent QA/QC Review of Topographic Data	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.1) Appendix A, Sections A.2, A.3, A.7 (specifically Subsection A.7.5), and A.8 (specifically Subsection A.8.6) Appendix M
Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix A, Section A.4 Appendix C, Sections C.1 and C.7 Appendices E, F, G, H, and M
Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix A, Section A.4 (specifically Subsection A.4.7) Appendix C, Sections C.3 and C.7
Floodplain Mapping	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2, 1.4.2.3, and 1.4.3.2) Appendix C, Sections C. 4 and C.6 (specifically Subsection C.6.1.3) Appendix D, Sections D.2 (specifically Subsection D.2.7) and D.3 (specifically Subsection D.3.7) Appendices E, F, G, H, K, L, and M

SECTION 6—SCHEDULE

The tasks documented in this Mapping Activity Statement shall be completed in accordance with the project schedule. The Multi-Hazard Information Platform (MIP) shall be used to report progress. The Mapping Partner will enter the initial schedule into MIP within three weeks of funds award. The data reported in the MIP will include estimated and actual completion dates, budget and amount spent, and the percent complete of each task identified in the Mapping Activity Statement. Each county identified in Table 1-1 will have separate schedule established.

SECTION 7—CERTIFICATIONS

Field Surveys and Topographic Data Development

A Registered Professional Engineer or Licensed Land Surveyor shall certify topographic data in accordance with 44 CFR 65.5(c). Certification of topographic data by the American Society for Photogrammetry and Remote Sensing is also acceptable.

Base Map Acquisition and Preparation

- A community official or responsible party shall provide written certification that the digital data meet FEMA minimum standards and specifications.
- The responsible Mapping Partner shall provide documentation that the digital base map can be used by FEMA. Please note that uploading base map data to the MIP does not constitute agreement that the digital base map can be used by FEMA. Documentation that the digital base map can be used by FEMA will still be required.

Certifications must be made at the time the intermediate data is submitted. For example, if hydrologic data is submitted, certification will be required at the time it is submitted.

Hydrologic Analyses, Hydraulic Analyses, and Floodplain Mapping

- A Registered Professional Engineer shall certify hydrologic and hydraulic analyses and data in accordance with 44 CFR 65.6(f).
- A Registered Professional Engineer or Licensed Land Surveyor shall certify topographic information in accordance with 44 CFR 65.5(c).
- Any levee systems to be accredited will be certified in accordance with 44 CFR 65.10(e).

Floodplain Mapping, Independent QA/QC Review of Floodplain Mapping and DFIRM Database

The DFIRM metadata files shall include a description of the horizontal and vertical accuracy of the DFIRM base map and floodplain information.

SECTION 8—TECHNICAL ASSISTANCE AND RESOURCES

Project Team members may obtain copies of FEMA-issued LOMCs, archived engineering backup data, and data collected as part of the Mapping Needs Assessment Process from FEMA and/or your Regional Project Officer.

General technical and programmatic information, such as FEMA 265 and the Quick-2 computer program, can be downloaded from the FEMA website at http://www.fema.gov./fhm/. Specific technical and

programmatic support may be provided through FEMA and/or its contractor; such assistance should be requested through the FEMA Project Officer specified in Section 12 – Points of Contact.

Project Team members also may consult with the FEMA Regional Project Officer to request support in the areas of selection of data sources, digital data accuracy standards, assessment of vertical data accuracy, data collection methods or subcontractors, and GIS-based engineering and modeling training.

SECTION 9 - CONTRACTORS

State Emergency Management Agency intends to use the services of AMEC Earth and Environmental as a contractor for this Flood Map Project. State Emergency Management Agency shall ensure that the procurement for all contractors used for this Flood Map Project complies with the requirements of 44 CFR 13.36.

Part 13 may be downloaded in PDF or text format from the United States Government Printing Office website at http://www.access.gpo.gov/nara/cfr/waisidx_04/44cfr13_04.html.

SECTION 10—REPORTING

State Emergency Management Agency shall provide progress and financial reports to the FEMA Regional Project Officer and Assistance Officer in accordance with Cooperative Agreement Articles V & VI , and 44 CFR 13.40 and 13.41.

Progress reporting shall utilize the MIP. Other progress reports are not anticipated. When the State Emergency Management Agency provides deliverables through the MIP, the State Emergency Management Agency shall ensure the MIP reflects the current status of the related task. The State Emergency Management Agency will submit 2 copies of the MIP Flood Engineering Report to the FEMA Assistance Officer for quarterly progress reporting.

The Project Officer, as needed, may request additional information on status on an ad hoc basis.

SECTION 10 - REPORTING

Status reports will be submitted on a monthly basis in accordance with the contract. At a minimum, these reports will include a summary of the work completed to date. The Project Officer, as needed, may request additional information on status.

SECTION 11—PROJECT COORDINATION

Throughout the project, all members of the Project Team will coordinate, as necessary, to ensure the products meet the technical and format specifications required and contain accurate, up-to-date information. Coordination activities shall include:

- Meetings, teleconferences, and video conferences with FEMA and other Project Team members on an ad hoc basis;
- Telephone conversations with FEMA and other Project Team members on an ad hoc basis;
- Updates to the MIP and other FEMA status information systems in accordance with requirements in Volumes 1 and 3 of *Guidelines and Specifications for Flood Hazard Mapping Partners*; and

- E-mail, facsimile transmissions, and letters, as required.

- Project Team members shall meet with the Regional Management Center and/or FEMA quarterly to review the progress of the project. These meetings will be held via a conference call at a mutually agreeable time to be determined. Typically the call will occur following the submittal of the quarterly progress report.

SECTION 12 – POINTS OF CONTACT

The points of contact for this Flood Map Project are Bob Franke, the FEMA Regional Project Officer; Jason Schneider, the Project Manager for State Emergency Management Agency; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, any additional FEMA assistance should be requested through the FEMA Regional Project Officer.

State Emergency Management Agency

Each party has caused this MAS to be executed by its duly authorized representative.

Ronald M. Reynolds, Director
Missouri State Emergency Management Agency

8-24-06
Date

Robert G. Bissell, Director
Federal Insurance and Mitigation Division
Federal Emergency Management Agency, Region VII

9/5/06
Date